

CLAIMS

What is claimed is:

1. A powder coating composition, comprising
at least about 0.1% by weight of a reaction product of an aminoplast and a
compound having one carbamate group and
a solid, thermosettable material.
2. A powder coating composition according to claim 1, comprising up
to about 40% by weight of the reaction product.
3. A powder coating composition according to claim 1, further
comprising a crosslinker reactive with the thermosettable material.
4. A powder coating composition according to claim 1, wherein the
powder coating particles are dispersed in a liquid medium.
5. A powder coating composition according to claim 4, wherein the
liquid medium is aqueous.
6. A powder coating composition according to claim 4, wherein the
liquid medium is thermosettable.

7. A powder coating composition according to claim 1, wherein the aminoplast is the reaction product of an activated amine selected from the group consisting of melamine, benzoguanamine, ureas, and carbamate functional materials reacted with an aldehyde selected from the group consisting of formaldehyde, acetaldehyde, crotonaldehyde, and benzaldehyde.

8. A powder coating composition according to claim 1, wherein the aminoplast is fully alkylolated.

9. A powder coating composition according to claim 1, wherein the aminoplast is fully etherified.

10. A powder coating composition according to claim 1, wherein the aminoplast is a fully etherified melamine-formaldehyde resin.

11. A powder coating composition according to claim 1, wherein the aminoplast is hexamethoxymethyl melamine.

12. A powder coating composition according to claim 7, wherein the activated amine is selected from the group consisting of 1,4-butanedicarbamate and 1,6-hexanedicarbamate.

13. A powder coating composition according to claim 7, wherein the activated amine is selected from polycarbamate compounds prepared by a step of reacting a first compound comprising at least one primary carbamate group and an active hydrogen group with a lactone.

14. A powder coating composition according to claim 13, wherein the active hydrogen group is an hydroxyl group.

15. A powder coating composition according to claim 14, wherein the polycarbamate compound is prepared by a second step of reacting the product of the first compound and the lactone with a second compound having a plurality of groups reactive with hydroxyl groups but not carbamate groups.

16. A powder coating composition according to claim 14, wherein the polycarbamate compound is prepared by a second step of reacting the product of the first compound and the lactone with one or more materials that convert the hydroxyl group on the reaction product to a carbamate group.

17. A powder coating composition according to claim 7, wherein the activated amine is selected from polycarbamate compounds having at least two carbamate groups and a hydrocarbon moiety with about 24 to about 72 carbon atoms.

18. A powder coating composition according to claim 1, wherein the compound having one carbamate group is selected from the group consisting of methyl carbamate, ethyl carbamate, and propyl carbamate.

19. A powder coating composition according to claim 1, wherein the reaction product has a softening point above about 40°C.

20. A method of coating a substrate, comprising:
applying a powder coating composition according to claim 1 to the substrate and curing the applied composition to form a cured coating.

21. A method of coating a substrate according to claim 20, wherein the reaction product of the aminoplast and the compound having one carbamate group reacts into the cured coating.

22. A method of coating a substrate according to claim 20, wherein the substrate is selected from metal substrates and plastic substrates.

23. A method of coating a substrate according to claim 20, wherein the powder coating composition comprises powder coating particles dispersed in a liquid medium.